

# SOCIAL MEDIA USAGE IN ACADEMIC RESEARCH

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## ABSTRACT

Recently researchers have used “conversation prism” and “social media prisma”, to consolidate social medias with respect to their use. Although both identified 25 types, having average five examples each, they did not identify contribution of each type in academic research. Moreover some of mentioned social services had been suspended or changed. In this paper we attempt to access each social media mentioned in conversation prism in order to first, identify services that are operational to date, services which have suspended and those which have changed during course of time. Second, we compare number of publications associated with each social media, in order to identify which social media has contributed most to academic research. Third, we attempt to find correlation between number of publications and development tools provided by respective social applications. Fourth, social medias are ranked with respect to number of times other social medias share content with respective social application. It was found that out of 168 social applications, 10% changed their service objective while 13% were suspended. Among all social application, AMAZON had highest i.e. 147,000 number of citations on Google scholar whereas 90.7% of total citations were contributed by top 30 social medias. For developers, 22 out of top 30 social medias provided developer options in form of either application programming interface (API) or software development kits (SDK) and Facebook was found to be most cross referred social media based on content sharing. Finally conclusion and future work of study is presented.

**Keywords:** *Social Media, Academic Research, Conversation Prism, Developer Tools, API, SDK*

## 1. INTRODUCTION

With evolution from web 1.0 to web 2.0, a new chapter was opened in internet's history known as “Social Media” which primarily focused on user generated content. Social media opened opportunities for diverse perspective of society e.g. personal life, career, ideas etc. to be shared and discussed online. Increasing content on social media drew interest of both academic researchers and people from marketing community [1]. Both concluded that social media cannot be underrated and foresee it to continuously change how people communicate and interact worldwide [2].

Today variety of social medias exist, which can be grouped into different categories. “Conversation prism” [8] and “social media prisma” [9] are most prominent social media classification efforts, where both attempt to group social medias into 25 different categories. Although both studies cover around 168 different social medias, they do not

identify which social media is more valuable with respect to academic research and which has more influence relatively. Also their lies possibility that social media can either change its service objective or be suspended, which is not illustrated by both studies.

To answer respective questions, section two identifies social media definition and enlist different categories proposed by both studies. Section 3 identifies aim of research and proposes a classification criteria of listed social medias. Section 4 explains results obtained by analyzing listed social medias with respect to classification criteria and finally section 5 concludes this research along with laying foundation of future work.

## 2. BACKGROUND KNOWLEDGE

This section first describes Web 2.0 and user generated content which lays foundation of

social media definition. Second, research attempts to group social media discussed and finally different types of social medias are mentioned.

## 2.1 Social media

Social media definition stands on balance between web 2.0 and user generated content. In order to understand better, web 2.0 and user generated content are explained as follows, leading to social media's widely accepted definition.

**WEB 2.0:** Term Web 2.0 was coined and published in year 2005 by Dale Dougherty and Tim O'Reilly[3], which was further updated by Tim O'Reilly in 2007 [4]. According to [4] Web 2.0 differs from web 1.0 based on multiple reasons explained as follows.

**Web as platform:** beginning of twenty first century was mostly dominated by operating systems, i.e. Microsoft windows, MAC OS etc. while websites remained mostly standalone and static. Web 2.0 supported the concept of web as platform to provide services to users. For example desktop application Britannica encyclopedia can be related to today's famous Wikipedia website.

**Utilizing collective intelligence:** Web 2.0 differs from web 1.0 based on intertwining of websites also known as cross linking. Web 2.0 supported cross linking of websites using hyperlinks, RSS feeds etc. which diverted web traffic from one website to other under same scope. Yahoo success story rely on web cross linking because their first version provided its users with useful links related to topic of interest.

**Data is essential:** Web 2.0 was superior to Web 1.0 because its era was rich with server side programming languages and evolving database systems designed especially for web. Data driven web applications are biggest success stories of Web 2.0 for example GOOGLE, Facebook and their services.

**Software release cycle's death:** Web 2.0 brought so many services which evolved with time but did not require its users to install newer version of software. This was made possible by group of features supported by Web 2.0

**Distributed implementations:** Web 1.0 was pure server side era where each request had to be processed at server side. Web 2.0 enabled

developers to split their code with respect to server side or client side execution. This enabled developers to apply modular updates to their web applications and provided seamless improving service to clients.

**Device independent service:** Web 2.0 had tremendous improvement in user interface design. It was made possible with Cascading style sheets (CSS) technology that enabled website to adapt changing display resolutions and browses.

**Enhanced user experiences:** Web 2.0 started its journey with Macromedia Flash player and later accompanied with AJAX, which enabled Web 2.0 to deliver its users with experience never imagined before. Animated banners, Web based multiplayer games, online editing tools etc. all were made possible with respective technologies.

**User Generated Content (UGC):** Digital User generated content's root can be found in 1979 when Jim Ellis and Tom Truscott, from duke university created Usenet. It was software system that relied on internet present at that time and was used to post public messages[5]. Similar software with different perspective of a community diary, was developed by Susan Abelson and Bruce. They named this software "Open Diary", which provided a platform to diary writers for sharing their thoughts[5]. Organization for Economic Cooperation and Development [7] outlined three basic requirement of user generated content

- First: User generated content is required to be published at some social networking website of public in nature to reach its related audience.
- Second: User generated content should have creative element in order to differentiate it from already present content.
- Third: User generated content should abide by context of service which host that content.

Listed requirements can be used to identify difference between user generated content and otherwise. For example content shared in email or instant messaging are excluded by first requirement, duplicate content is excluded based on second requirement and finally third requirement align social content with respect to service it is posted on, e.g. daily life social activities are posted on Facebook while professional activities on Linked in etc.

Based on brief description of Web 2.0 and user generated content, [5] proposed social media definition as

*“Social media is a collection of those internet based applications which rely on technological foundations of Web 2.0 and allows creation, exchange of user generated content.”*

## 2.2 Grouping social media

Social media is growing with passage of time and with so many social applications, a need to group these applications with respect to different types was first addressed by Brian Solis [8]. Brian

graphic comprised of twenty five types, each containing around five examples.

Similarly Ethority, a social media analysis company [9], inspired by Solis, proposed “social media prisma” info graphic, shown in Figure 2. Their info graphic was focused towards use of social media in Europe. Although it had same number of types, its types were labeled more appropriate as compared to conversation prism. Also “social media prisma” contained more example social medias as compared to conversation prism.



Figure 1: Conversation Prism

Solis presented “conversation prism”, a collection of social applications with respect to different types in an info graphic, shown in Figure 1. Brian’s info

## 2.3 Types of social media

Both info graphics contained 25 types of social medias. Among which 14 types had similar names i.e. Pictures, Social Bookmarks, Influence, Social Network, blog, Crowd Wisdom, Q&A, Location, Wiki, Review & Rating, Video, Presentation, Music, Live casting whereas rest had collection of similar social media while their names were different. One type of conversation prism i.e. "Events" was not mentioned in social media prisma whereas three types of social media prisma i.e. "gaming", "mobile companions" and "twitter ecosystems" were not mentioned in conversation prism.

media prisma, conversation prism holds more citations because it was first effort to group social media with respect to different types [12] and recently these types were used by [8] for identification of appropriate social web applications, which were later used for segmentation purposes.

Although conversation prism citations are increasing, social media applications mentioned inside are either changing or being suspended. All social medias are also presented equally inside conversation prism where some facilitate fraction of users of the size of other social medias.

## 3. AIM & CLASSIFICATION CRITERIA OF RESEARCH

Among conversation prism and social

### 3.1 Aim of research

In this study, first we access each social application mentioned inside conversation prism in order to identify services which were operational to

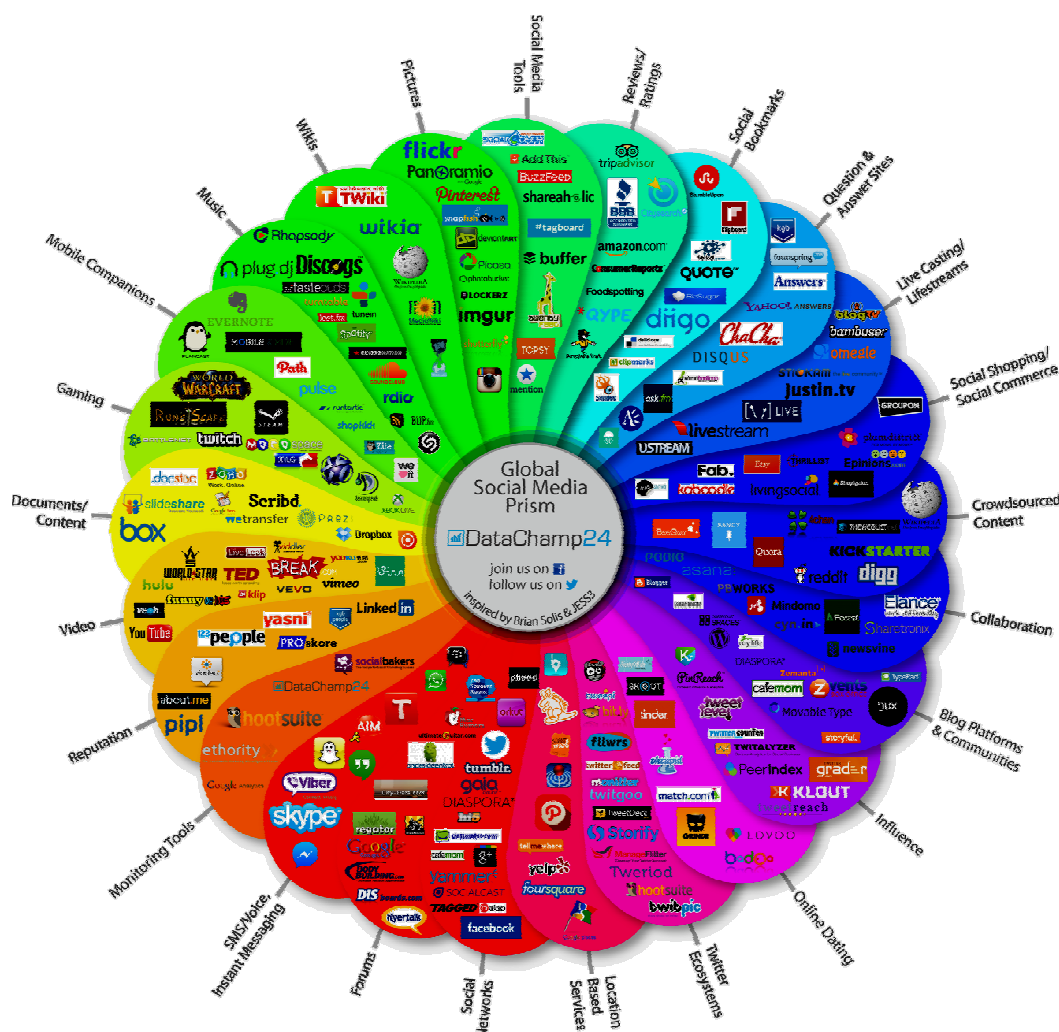


Figure 2: Social media prisma



date, services which were suspended and services which have changed during course of time. Second, we search each social service on Google scholar in order to generate a relative graph between most cited social services. Third, we attempt to find correlation between citations of social services versus development options provided by these social services and finally most widely used social medias are identified based on “share” cross referring.

### 3.2 Classification criteria

To accomplish all objectives mentioned in aim of research, we use TAG based approach for classification of social media applications. [10] defined TAG based approach as units of meaning assigned to a study and used it for classification of their primary studies. TAG based approach identifies and associates concepts related to literature explicitly in form of keywords [11]. Therefore in this study we classify social media application with respect to TAGs described Table 1.

Table 1: TAGs used for classification

#	TAG	Values
1	"Status"	Operational   Suspended   Changed
2	"Link"	Application web link
3	"Citations"	Google scholar citations for respective "Link"
4	"SDK"	Web link to application SDK if exist
5	"Free"	Is application free to use?
6	"Require login"	Does application require login?
7	"Share with"	List of other social applications with which content of current application can be shared

First TAG attribute is “status” and it can have three values i.e. active, suspended, changed. Social media application is active till time of writing this article was tagged as active while others were either found suspended or changed. Second TAG attribute is “Link” which as name suggests represent hyper link to respective social application. Third TAG attribute is “citations” which represented number of citations found when respective “Link” of the website was strictly searched on Google scholar. Fourth TAG attribute is “SDK” which represent hyper link to software

development kit or application programming interface of social media application, if it exists. Fifth and sixth TAGs i.e. “Free” and “Require Login” were related to nature of social media application and finally seventh TAG was named as “Share with” which served as a list of other social applications with which current application can share its content with.

### 4. RESULTS

Total of 168 social applications were represented in “conversation prism”, out of which 16 changed their service objectives whereas 22 services were found suspended. Figure 3 shows comparison between active, changed and suspended services whereas figure 4 shows services that were either changed or suspended.

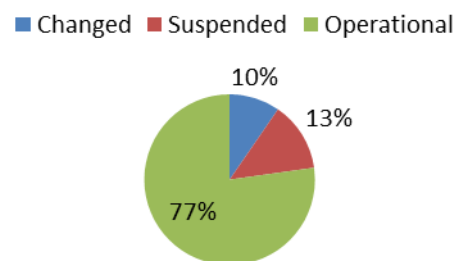


Figure 3: Percentage of social media status



Figure 4: Changed & suspended social applications

For all 168 social applications, citations were retrieved from Google scholar using social application website link. A total of 994982 citations were found out of which 90.7 % were covered by thirty social applications. Top 15 of these 30 applications are shown in Figure 5.

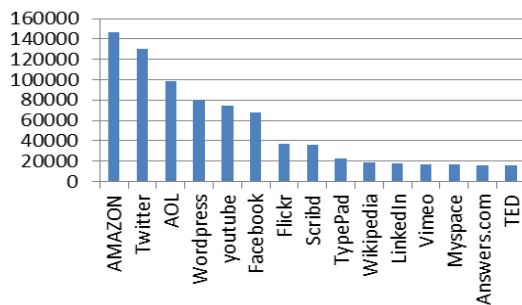


Figure 5: Social applications ranked with respect to Google scholar citations

It was observed that out of top 15 social applications, 13 had provided developer options listed in Table 2. Developer options include application programming interface (API) or software development kits (SDK). API is a set of routines, protocols or tools provided by a software / website, so that other application can leverage data present on respective application for use [Z1], whereas SDK is code libraries built around API for ease of developers.

Table 2: Developer options

Application	Developer options
AMAZON	<a href="https://aws.amazon.com/tools/">https://aws.amazon.com/tools/</a>
Twitter	<a href="https://dev.twitter.com/overview/api">https://dev.twitter.com/overview/api</a>
Wordpress	<a href="https://github.com/Pleasurazy/wordpress-posts-crawler">https://github.com/Pleasurazy/wordpress-posts-crawler</a>
youtube	<a href="https://developers.google.com/resources/api-libraries/download/youtube/v3/java">https://developers.google.com/resources/api-libraries/download/youtube/v3/java</a>
Facebook	<a href="https://developers.facebook.com/">https://developers.facebook.com/</a>
Flickr	<a href="https://github.com/callmeal/Flickr4Java">https://github.com/callmeal/Flickr4Java</a>
Scribd	<a href="https://code.google.com/archive/p/javascribd/downloads">https://code.google.com/archive/p/javascribd/downloads</a>
TypePad	<a href="https://github.com/typepad/python-typepad-api">https://github.com/typepad/python-typepad-api</a>
Wikipedia	<a href="http://code.google.com/p/gwtwiki/">http://code.google.com/p/gwtwiki/</a>
LinkedIn	<a href="https://github.com/3pillarlabs/socialauth">https://github.com/3pillarlabs/socialauth</a>
Vimeo	<a href="https://github.com/clickntap/Vimeo">https://github.com/clickntap/Vimeo</a>
Answers.com	<a href="https://api.answers.com/documentation/">https://api.answers.com/documentation/</a>

TED	<a href="http://developer.ted.com">http://developer.ted.com</a>
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Developer options are also essential for developing code for research purposes. Researchers have used tools to deploy their experiments on cloud [13], for market analysis [14], data mining [15], sentiment analysis [16], opinion mining [17], identification of influential people [18] etc.

Another important parameter that identify influence of social application is how much existing social applications can share their content with other social application. Based on this criteria, Figure 6 shows relative share score of social applications. It shows that Facebook is first choice of content sharing in whole social application community.

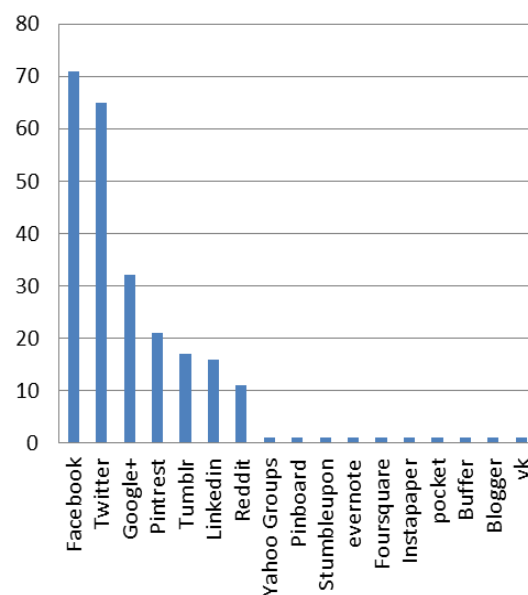


Figure 6: Percentage of social media status

## 5. CONCLUSION & FUTURE WORK

In conclusion, this study highlights issues in existing efforts of classification and grouping of social medias. It identifies the need of updating “conversation prism” as 10% of total mentioned social medias were found changed and 13% suspended.

This research rank social media based on citations which can help researchers identify most active social medias in academic research. Another rank list was also generate to identify most cross shared social media.

In future we plan to propose framework for live updating “social spectrum” similar to conversation prism and implement it as a web service so that other researchers can benefit from live ranking of social medias.

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